SYNTHESIS AND EVALUATION OF TC-99m AND Cu-62 LABELED FATTY ACID ANALOGS

Y. Arano, H. Nishio, Y. Magata, T. Hosotani, A. Yokoyama, H. Saji and K. Torizuka. Faculty of Pharmaceutical Sciences and School of Medicine, Kyoto University, Kyoto.

Radiolabeled fatty acid analogs have been attracting great interest as myocardial imaging agents, and their labeling with generator eluted radionuclides, TC-99m and Cu-62 are highly desirable. Based on our preliminary studies on Tc and Cu di-thiosemicarbazon (DTS) complexes, two fatty acid analogs containing DTS molecule as the metal coordinating site were synthesized: a fatty acid analog containing DTS molecule at the α-position (FA-DTS) and a phenyl fatty acid analog containing DTS molecule at the p-position (PFA-DTS).

These two fatty acid analogs were labeled with Tc-99m and Cu-64, and their biodistribution in mice were compared. As for Tc-99m labeled compounds, while myocardial radioactivity of Tc-99m-PFA-DTS remained, that of Tc-99m-FA-DTS cleared slowly. On the other hand, while myocardial activity after conjugation of DFO was kept enough as the one molecule of protein was conjugated with less than one clustered compound.

Blood retention of HSA-(AMY-DFO)0.9-Ga-67 was higher than that of HSA-1-131 [T1/2(67)=50 hrs, T1/2(1-131)=5.7 hr.]. Monoclonal antibodies, such as R11D10 and OC-125, showed high immunological reactivity after conjugation of clustered compounds. The immunological reactivity of 19-9, however, was lost after conjugation of AMY-DFO. It was suggested that this type of clustered compound can not be used with monoclonal antibody which recognize the sugar structure of its antigen.

In conclusion, the clustered compound is useful to obtain the radiolabeled protein with high specific radioactivity as it can introduce a lot of DFO on one protein molecule.